Contact Investigation

A. For complete guidelines on structuring a contact investigation see the Guidelines for the Investigation of Contacts of Persons with Infectious Tuberculosis. MMWR 2005:54(No.RR-14). The goals of a contact investigation are (1) rapid identification of individuals who are high priority contacts to a known or suspected case of pulmonary, laryngeal or pleural TB; 2) timely initiation of appropriate treatment for those determined to be recently Infected or exposed with a significant risk for progression to disease; and 3) identification and treatment of additional individuals found to have suspected TB disease in order to prevent further spread of disease.

Prioritization of contacts is based on the characteristics of the case, the individual risk factors of the contacts, and the environment in which the exposure occurred.

1. **Case Characteristics:**
   - High-priority cases/suspects have pulmonary, laryngeal, or pleural TB with a positive smear and/or cavitary disease.
   - Medium priority cases/suspects have smear negative pulmonary, laryngeal, or pleural TB with AFB negative sputum smear and/or a non-cavitary chest x-ray that is consistent with TB.
   - Low priority cases/suspects include all extrapulmonary cases where pulmonary disease has been ruled out.

2. **Contact risk factors:**
   a. High-priority contacts include
      - HIV+.
      - Household contacts.
      - Contacts living in congregate settings.
      - Contacts < 5 years old.
      - Contacts exposed during certain medical procedures, e.g., brochoscopy.
      - Contacts with medical risk factors that increase the likelihood of progression to disease, e.g. silicosis, diabetes mellitus, a history of gastrectomy or jejunoileal bypass surgery.

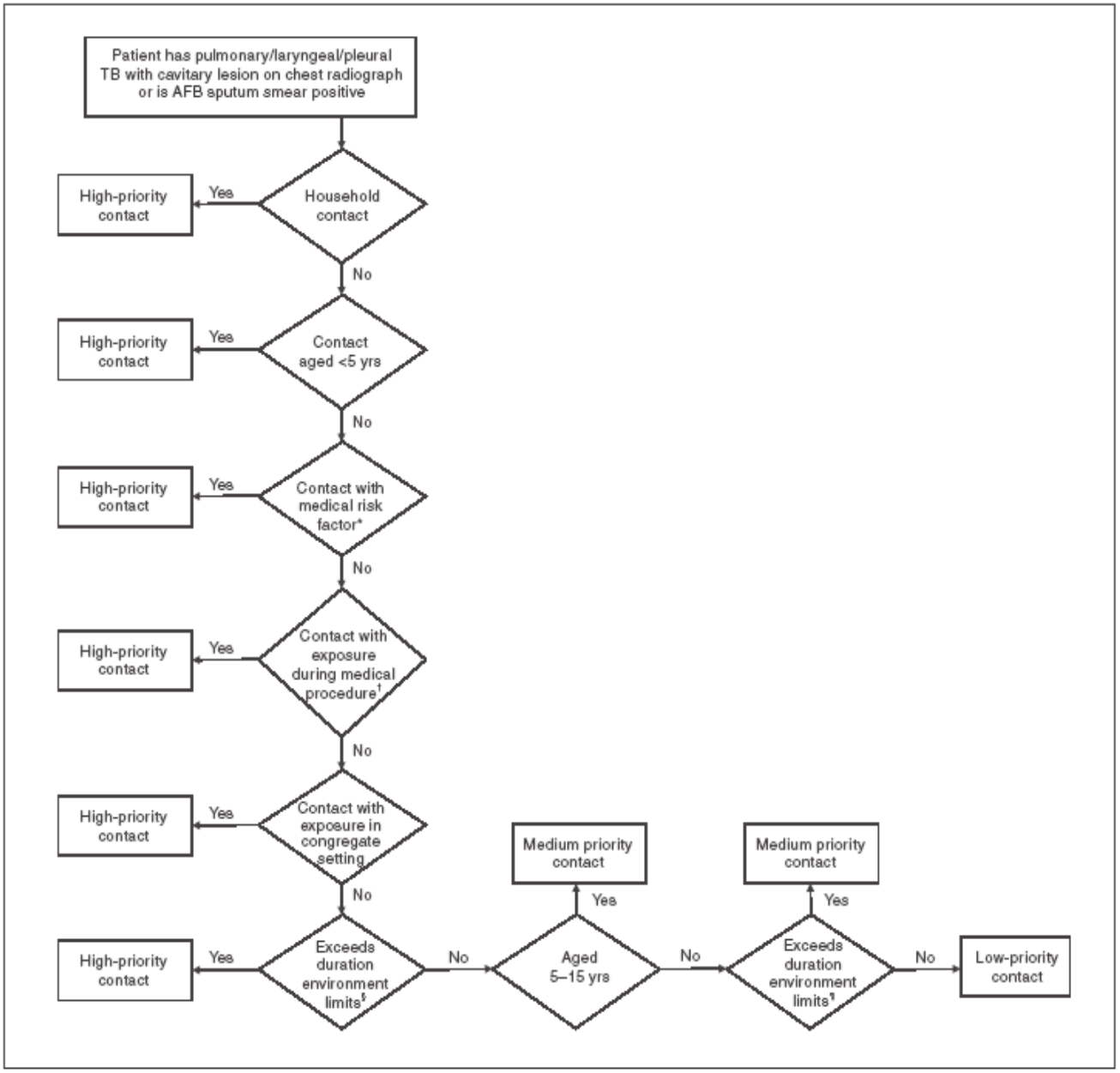
   b. Medium-priority contacts include
      - Contacts 5 through 14 years of age.

   c. Low-priority contacts are those who are below the threshold for medium priority.

3. **Environment in which the exposure occurred**
   - High Priority Contacts
     - ❖ ≥ eight hours in a small poorly ventilated space.
     - ❖ ≥ 16 hours in a small well ventilated space.
     - ❖ ≥ 24 hours in a classroom size space.
     - ❖ ≥ 100 hours in a large open area.
   - Medium Priority Contacts
     - ❖ four to 7 hours in a small poorly ventilated space.
     - ❖ eight to 15 hours in a small well ventilated space.
     - ❖ 12 to 23 hours in a classroom size space.
     - ❖ 50 to 99 hours in a large open area.

B. Algorithim for Contacts Exposed to Persons with AFB Smear Positive Sputum or with Cavitary Tuberculosis .

FIGURE 2. Prioritization of contacts exposed to persons with acid-fast bacilli (AFB) sputum smear-positive or cavitary tuberculosis (TB) cases

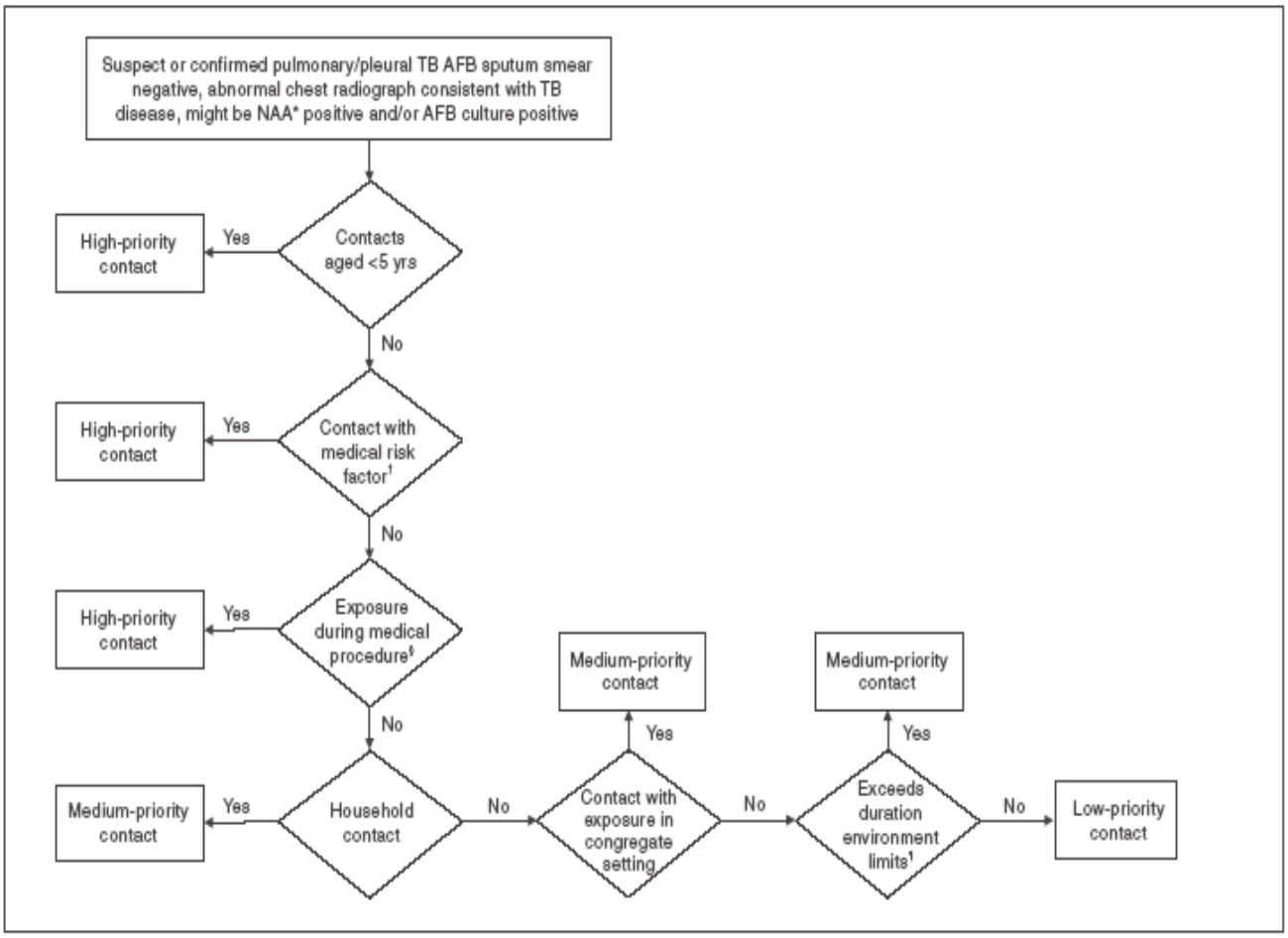


* Human immunodeficiency virus or other medical risk factor.
† Bronchoscopy, sputum induction, or autopsy.
§ Exposure exceeds duration/environment limits per unit time established by the health department for high-priority contacts.
¶ Exposure exceeds duration/environment limits per unit time established by the health department for medium-priority contacts.

Source: CDC, Guidelines for the Investigation of Contacts of Persons with Infectious Tuberculosis. MMWR 2005:54(No. RR-14); [page12]

C. Algorithim for Contacts exposed to Persons with AFB Sputum Smear Negative Non-cavitary Tuberculosis.

FIGURE 3. Priority assignments for contacts exposed to persons with acid-fast bacilli (AFB) sputum smear-negative tuberculosis (TB) cases



*Nucleic acid assay.
†Human immunodeficiency virus or other medical risk factor.
§Bronchoscopy, sputum induction, or autopsy.
¶Exposure exceeds duration/environment limits per unit time established by local TB control program for medium-priority contacts.

Source- CDC, Guidelines for the Investigation of Contacts of Persons with Infectious Tuberculosis. MMWR 2005:54(No. RR-14); [page13]

D. Structuring a Contact Investigation

1. Initiate investigation within one business day. This should be a face-to-face interview whenever possible.
2. Evaluate high-priority contacts to laryngeal, pulmonary, and pleural tuberculosis within seven days of notification (see figures 2 and 3 on pages VII-2 and VII-3).
3. Evaluate medium-priority contacts to laryngeal, pulmonary, and pleural tuberculosis within 14 days of notification. Do a follow-up TST on medium priority contacts to smear negative, non-cavitary cases only if the initial investigation reveals evidence of recent transmission. (see figures 2 and 3 on pages VII-2 and VII-3).
4. Low priority contacts should not be tested unless objectives for high and medium priority contacts are being met. If a decision has been made to do skin testing on a low priority contact, the initial skin test may be delayed until eight weeks after the most recent exposure.
5. Complete initial investigation of contacts within 30 days and enter this information into NCEDSS using the contact summary wizard.
6. Infants, children < 5 years old and HIV-positive individuals have the highest priority for immediate evaluation and initiation of TLTBI when indicated.
7. Provide HIV counselling, testing and referral on all contacts.
8. Establish relative risk of tuberculosis transmission:

    a. Infectiousness of the case
        - Acid fast bacilli on sputum smear.
        - Presence of cavitation on chest x-ray.
        - TB laryngitis.
        - Productive cough.
        - No therapy or just started therapy.

    b. Determining the infectious period
        - Given the uncertainty inherent in establishing the infectious period, a recommended start date three months prior to reported symptom onset or first positive finding consistent with TB disease (whichever is longer) should be used.
        - Onset of symptoms.
        - Smear and culture results.
        - Extent of disease (cavity).
        - Below see Table 2 from the NTCA and CDC Guideslines for the Investigation of Contacts of Persons with Infectious Tuberculosis, December 2005.

TABLE 2. Guidelines for estimating the beginning of the period of infectiousness of persons with tuberculosis (TB), by index case characteristic

Characteristic			
TB symptoms	AFB* sputum smear positive	Cavitary chest radiograph	Recommended minimum beginning of likely period of infectiousness
Yes	No	No	3 months before symptom onset or first positive finding (e.g., abnormal chest radiograph) consistent with TB disease, whichever is longer
Yes	Yes	Yes	3 months before symptom onset or first positive finding consistent with TB disease, whichever is longer
No	No	No	4 weeks before date of suspected diagnosis
No	Yes	Yes	3 months before first positive finding consistent with TB

SOURCE: California Department of Health Services Tuberculosis Control Branch; California Tuberculosis Controllers Association. Contact investigation guidelines. Berkeley, CA: California Department of Health Services; 1998.
* Acid-fast bacilli.

c. Characteristics of the environment:
- Volume of air space common to case and contacts.
- Adequacy of ventilation, e.g. any fresh air.
- Degree of recirculation of shared air.

9. Interview patient in the hospital and home to:
   a. Establish rapport and trust;
   b. Explain health department services;
   c. Obtain names of contacts; and
   d. Establish transmission patterns.

10. List contacts and rank them according to relative risk of tuberculosis exposure (high, medium, or low priority).

11. Expand the investigation, if indicated, based on:
   a. Identification of additional contacts.
   b. Evidence of recent transmission as evidenced by high numbers of positive TST's (10 percent or at least twice the rate of a similar population without recent exposure, whichever is greater).
   c. Re-interview of case and high priority contacts.

12. Repeat TST on high-priority contacts eight weeks after exposure has ended.

E. <u>High-Priority Contacts to Pulmonary, Laryngeal, and Pleural Tuberculosis</u>

Refer to figure 3, page VII-3.

A chest x-ray must be obtained to rule out active pulmonary TB <u>before</u> initiating treatment for latent TB infection (TLTBI) regardless of TST result.

A chest x-ray is not needed for asymptomatic contacts who have had a previous positive TST, and a previous negative chest x-ray <u>unless</u> there is an extremely high risk for developing TB disease, e.g., HIV/AIDS or immunosuppressive drug use such as long-term corticosteroids or anti-Tumor Necrosis Factor (TNF) drugs.

1. **Symptomatic contacts of any age should receive a TST, chest x-ray and have three sputum specimens collected for bacteriology. The collection of the first specimen in each set of three should be observed by the nurse.**

2. **Symptomatic contacts should be isolated until sputum smear AFB results are negative for two consecutive specimens**

3. Asymptomatic contacts can be managed by the health department TB nurse under signed standing orders (see Chapter III for standing orders).

4. Asymptomatic contacts < 5 years of age.

   a. Initial TST is 0-4mm, obtain chest x-ray (PA & lateral views)
      - If chest x-ray is normal, treat for LTBI until the evaluation is complete (window period prophylaxis). If for any reason the family refuses to start window prophylaxis contact your TB nurse consultant.
      - If chest x-ray is abnormal, consult physician.
      - Repeat TST in eight weeks:
        - If repeat TST is 0-4mm and exposure has ended, stop treatment.
        - If repeat TST is > 5mm, repeat chest x-ray; if x-ray is negative for TB disease, complete LTBI treatment.

   b. Initial TST is ≥ 5mm, obtain chest x-ray (PA & lateral views)
      - If chest x-ray is normal, treat for LTBI.
      - If chest x-ray is abnormal, consult physician.

5. Asymptomatic contacts 5 years of age or older

   a. Initial TST is 0-4mm.
      - Initiate treatment of LTBI if circumstances suggest an extremely high risk for developing TB disease, e.g., HIV/AIDS or imunosuppressive drug use such as Remicade and other anti-TNF drugs or long-term corticosteroids.
      - Initiate window period prophylaxis until the evaluation is complete if other contacts with a similar degree of exposure demonstrate a high prevalence of **new** infection.
      - If treatment is to be initiated, obtain chest x-ray:
        - If chest x-ray is normal, treat as indicated in 4.a above.
        - If chest x-ray is abnormal, consult physician and notify nurse consultant.
      - Repeat TST in eight weeks as indicated above:
        - If severely immunocompromised, continue treatment of LTBI regardless of TST result.
        - If repeat TST is 0-4mm and exposure has ended, stop treatment, if initiated. Evaluation is complete.
        - If repeat TST is ≥ 5 mm, continue treatment of LTBI until a full course of treatment has been completed. If patient is between 5-14 years old and given window period prophylaxis due to high risk and the repeat TST is ≥5mm, another chest x-ray should be obtained to rule out active

disease. If chest x-ray is normal complete treatment of LTBI.

b. Initial TST is ≥ 5mm, obtain chest x-ray:
- If chest x-ray is normal, treat for LTBI.
- If chest x-ray is abnormal, consult physician, and notify nurse consultant.

6. Documented previously positive TST and no previous TLTBI
- Asymptomatic individual who is willing to take TLTBI:
- Obtain chest x-ray if individual is HIV+ or most recent x-ray is > 24 months old.
- If chest x-ray is normal, start treatment ofLTBI .
- If chest x-ray is abnormal, consult physician.

7. Documented previously positive TST and previous treatment ofLTBI, asymptomatic and HIV negative, no further follow-up is indicated:
- if HIV+ or severely immunocompromised, retreat (INH for nine months) after obtaining chest x-ray.

F. Contacts to Extrapulmonary TB

A contact investigation should be carried out only on extrapulmonary cases who are under 5 years of age. The purpose of the investigation is to find the source case who may have exposed the child.

A contact investigation is not indicated for extrapulmonary cases 5 years of age or older.

Administer TST; interpret TST according to individual risk factors and treat according to guidelines.

G. Infant Born in Household where Mother or Family Member has Pulmonary TB Disease

If mother or family member considered infectious, separate newborn from mother or family member until TB case is considered to be non-infectious.

Evaluation of newborn infant :

1. Initial TST is 0-4mm, obtain chest x-ray (PA & lateral views):
- If chest x-ray is normal, treat with INH until the evaluation is complete and repeat TST in eight weeks.
- If chest x-ray is abnormal, consult physician and notify nurse consultant.
- If repeat TST is 0-4mm andthe infant is > 1 year of age at the time of repeat testing, and exposure has ended, stop treatment.
- For infants < 1 year of age, consult with the nurse consultant before stopping LTBI treatment . If the mother was the source of potential exposure of if the infant had significant contact with the source, and LTBI cannot be reliably excluded due to the age of the infant at the time of the repeat TST, consider continuation of a full course of treatment.

- If repeat TST is ≥ 5mm, obtain chest x-ray and re-evaluate for TB disease; If no disease, continue INH for a total of nine months.

2. Initial TST is ≥ 5mm, obtain chest x-ray:
   - Evaluate for TB disease; if no disease,give INH for a total of nine months.

H. Infant Born to Mother with Hematogenous Spread of Tuberculosis Disease

1. TST newborn, obtain chest x-ray and perform other appropriate tests to rule out congenital tuberculosis.

2. TST is usually negative in a newborn, therefore, give INH, RIF, and PZA until TB disease is ruled out.

3. If congenital tuberculosis is ruled out, repeat TST in eight weeks and treat according to G.1 above.

4. Evaluate all other close contacts in newborn's environment before infant discharged from hospital.

I. Contacts to INH Resistant TB Disease

Rifampin is the drug of choice when treating a newly infected contact to an INH resistant case of TB disease

Rifampin must be administered on a daily basis and may not be given on a twice weekly schedule. DOPT for these contacts is strongly encouraged.

J. Contacts to INH and RIF Resistant TB Disease (MDR or XDR-TB)

1. All contacts to a case of MDR or XDR TB should be closely monitored for at least two years after exposure regardless of treatment .
2. "None of the potential regimens for persons likely to be infected with MDR-TB have been tested fully for efficacy and those regimens are often poorly tolerated. For these reasons, consultation with a physician who specializes in care and treatment of tuberculosis is recommended for selecting and managing the care of contacts" MMWR *Guidelines for the investigation of contacts of persons with infectious TB* December 16, 2005. Consult with the State TB Control Physicians for an appropriate regimen for treating contacts to a MDR case. DOPT for these contacts is strongly encouraged.

K. Correctional Facilities

When an infectious TB patient is identified in a prison or jail it can be difficult to determine a contacts priority level since it is often difficult to determine how much exposure may have occurred. Unless there are specific tracking records that can indicate that a contact has had only brief exposure, these contacts should be assigned high priority. For more information about conducting contact investigations in a correctional facility refer to Prevention and Control of Tuberculosis in Correctional Facilities: Recommendations from CDC MMWR 2006;55(No. RR-9) https://www.cdc.gov/mmwr/preview/mmwrhtml/rr5509a1.htm

L. Contact Investigation by Other Health Care Facilities

Local health departments should monitor other health care facilities to:

1. Assist in identifying high and medium-priority contacts.
2. Ensure complete and accurate data.
3. Collect and evaluate TST data.
4. Provide standardized forms.
5. Provide medication if indicated.
6. Ensure monthly monitoring of those on TLTBI if providing medication.
7. Provide expert guidance for treatment and management issues.

M. Documentation

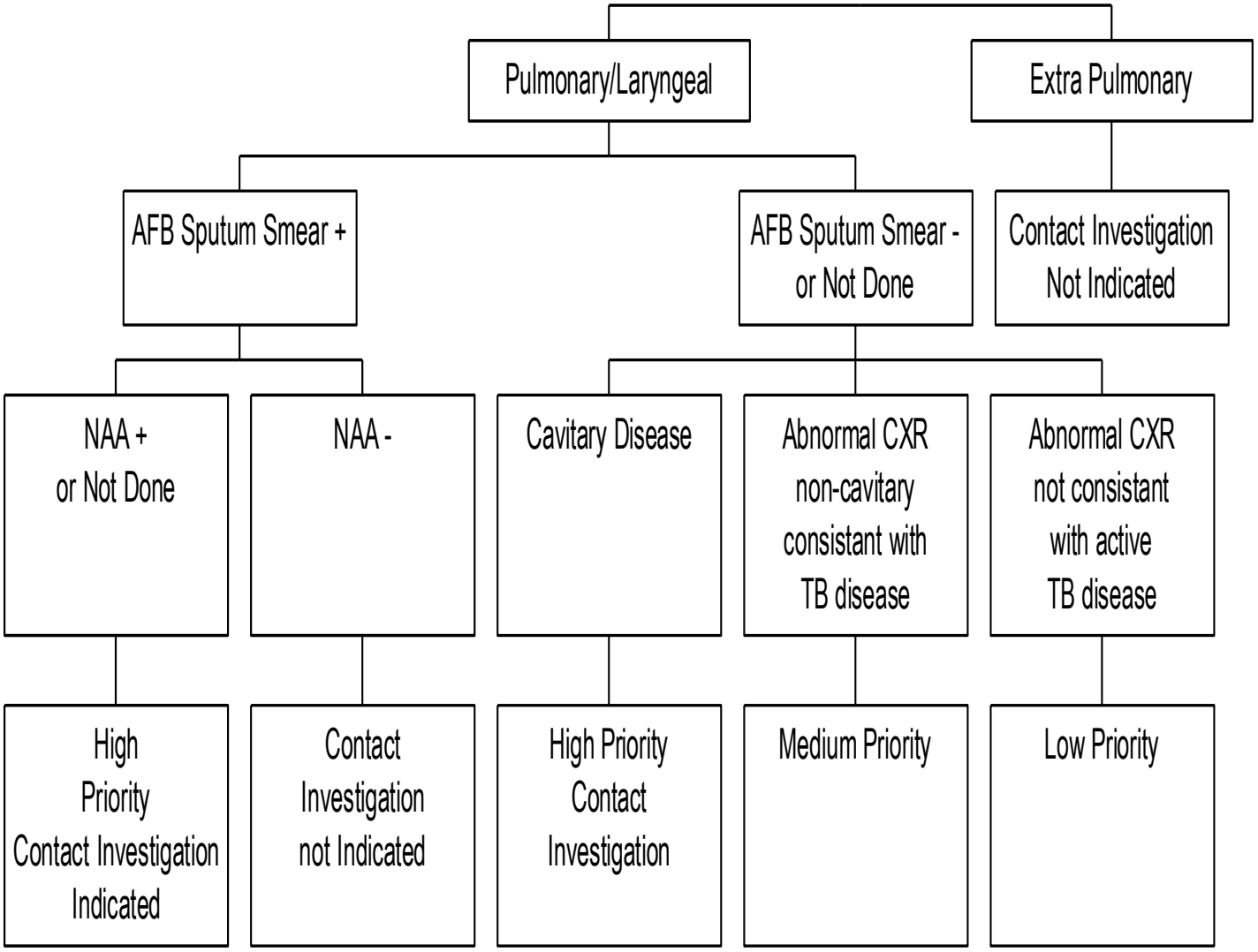
All contact investigation data must be recorded in the medical record of the TB case for epidemiological and surveillance purposes.

All contacts must be entered into NCEDSS by completing a contact summary wizard within 30 days on the contact being identified.

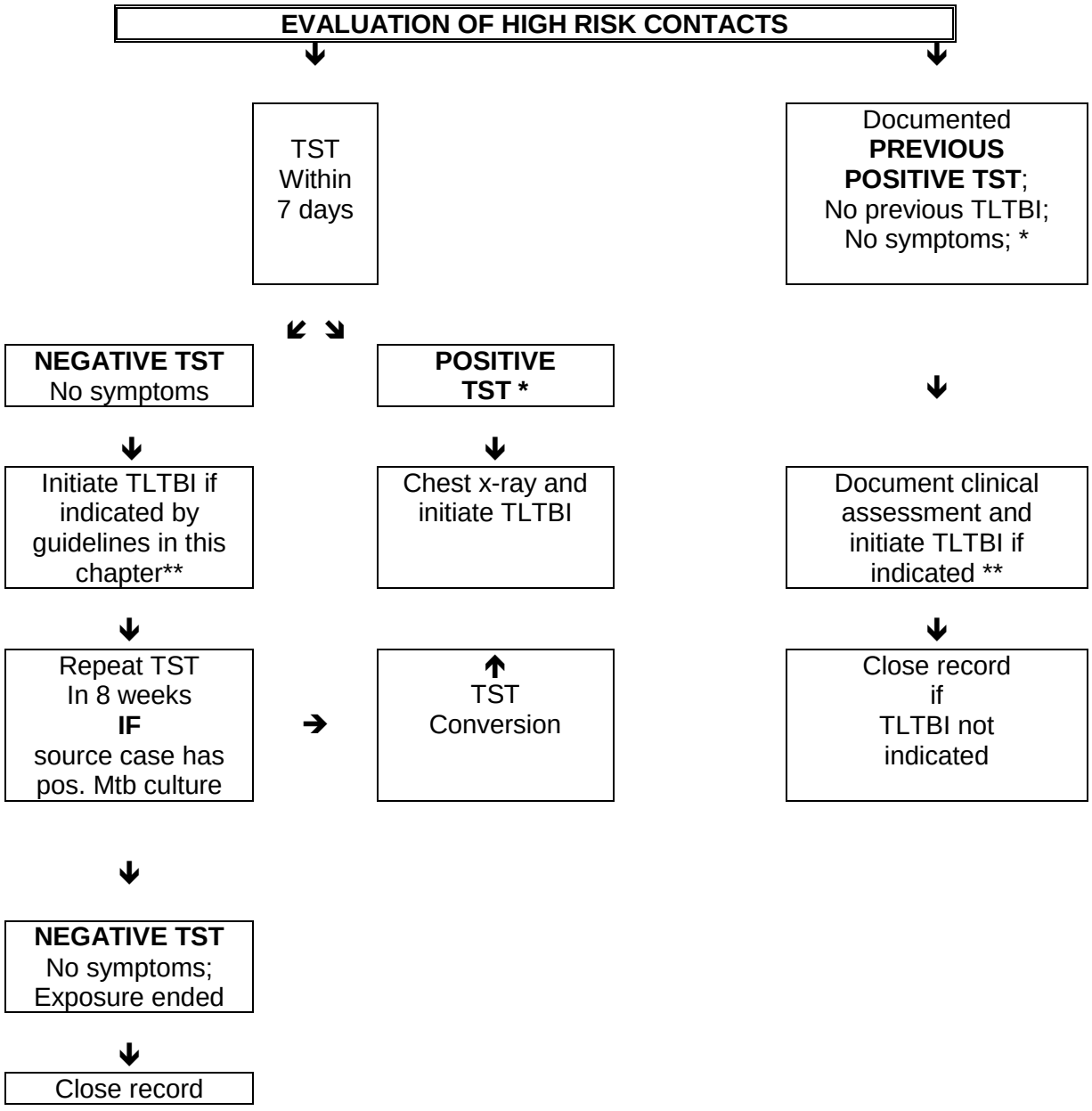
Contact information (e.g. names, TST results) should not be released to another health care provider or to the patient without obtaining consent of the contacts named.

N.

Algorithm for Determining Priority of Contact Investigation



O. High Risk Contacts to Infectious Pulmonary TB Cases



*** Obtain sputums and x-ray on individuals with symptoms regardless of TST results**

**** Do chest x-ray before any individual is placed on treatment for latent TB infection**